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New records of threatened cotingas (Aves, Cotingidae) in fragments of Atlantic Forest in southeastern Bahia, Brazil

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Abstract

We provide new records of three globally threatened species of bird belonging to the family Cotingidae: *Procnias nudicollis* (Vieillot, 1817), *Xipholena atropurpurea* (Wied, 1820), and *Cotinga maculata* (Statius Müller, 1776). These findings in non-protected areas of the Brazilian Atlantic Forest and, for *C. maculata*, at higher altitudes than previously reported, improve our understanding of the distribution of these threatened species and can aid in conservation efforts to protect them.

Keywords

Banded Cotinga, conservation, Endangered species, geographical distribution, new occurrence

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Introduction

The family Cotingidae is endemic to the Neotropical region and has a distribution ranging from Mexico to Argentina (Snow 1982). This family of birds comprises 25 genera and 65 species (Winkler et al. 2020), which vary from small understory to large canopy specialist species that are well known by their diversity of sexual dimorphisms, plumage coloration, vocalization, and breeding systems (Berv and Prum 2014). Cotingid species are predominantly frugivorous and occupy forested areas (Sick 1997; Pizo et al. 2002; Kissling et al. 2009). It is noteworthy that several species of the family are threatened due to increased deforestation (BirdLife International 2019). There are 31 species of Cotingidae in Brazil (Piacentini et al 2015), and five of them are globally threatened (BirdLife International 2019). Four of these threatened cotingid species—*Carpornis melanocephala* (Wied, 1820), *Xipholena atropurpurea* (Wied, 1820), *Procnias nudicollis* (Vieillot, 1817), and *Cotinga maculata* (Statius Müller, 1776)—inhabit the Brazilian Atlantic Forest, a biodiversity hotspot that has been severely deforested and fragmented, impacting populations of these and many other species (Myers et al. 2000; Ribeiro et al. 2009).

The distributions of these four threatened species in the Atlantic Forest differed from each other but in general originally extended from northeastern Brazil

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to eastern Paraguay and northern Argentina. *Procnias nudicollis*, for example, had a wider distribution occupying the entire above-mentioned region, but currently it is only found from southern to northeastern Brazil (BirdLife International 2020a). *Carpornis melanocephala and X. atropurpurea*, on the other hand, inhabited only a smaller portion of the Atlantic Forest, from southern (*X. atropurpurea*) and southeastern (*C. melanocephala*) to northeastern Brazil (CEMAVE 2018; BirdLife International 2019). Nowadays, *C. melanocephala* populations are restricted to few locations within an extent of occurrence of 23,000 km^2 (CEMAVE 2018), with their presence mainly restricted to protected areas, and only 10,000 mature individuals are estimated to remain in the wild (CEMAVE 2018). In addition, *X. atropurpurea* is historically known from only 13 protected areas in isolated fragments distributed in an extent of occurrence of 1,000 km^2, with also an estimated population of 10,000 mature individuals (CEMAVE 2018). In comparison to the other three species reported here, *C. maculata* had the narrower historical distribution, encompassing Rio de Janeiro, Espírito Santo, eastern Minas Gerais, and southern Bahia (Collar et al 1992; CEMAVE 2018). *Cotinga maculata* is globally classified as Critically Endangered and is the most threatened species of its family in the Brazilian Atlantic Forest (BirdLife International 2020b). Previously, it was believed to be locally extinct in the states of Rio de Janeiro and Minas Gerais but was rediscovered in Minas Gerais in 2003 (CEMAVE 2018). Its population is currently estimated at 250 adult individuals distributed in different isolated populations as a result of habitat loss, fragmentation, and illegal trade (CEMAVE 2018).

Here we present new records for three globally threatened species of Cotingidae inhabiting two unprotected areas in the southeastern portion of Bahia state, northeastern Brazil: *X. atropurpurea*, *P. nudicollis*, and *C. maculata*.

Methods

Our study was carried out in two fragments of Atlantic Forest located in the southeastern portion of Bahia, Brazil. The first fragment partly covers the municipalities of Apuarema, Ibirataia, Nova Ibiá, Jequié, and Itamari (Fig. 1). The upland areas of this forest fragment underwent an extreme habitat degradation from 1980 until today when it was selectively logged, mainly for wood extraction. The lowland areas were converted to pasture and cocoa plantations. The area is characterized by a dense ombrophilous fragment (ca 2,500 ha) of Atlantic Forest at an altitude of 280–760 m. The forest fragment is within the municipality of Apuarema (known as "Estivado" or "Pilão sem Boca").

The second studied area is approximately 20 km southwest of the urban zone of the municipalities of

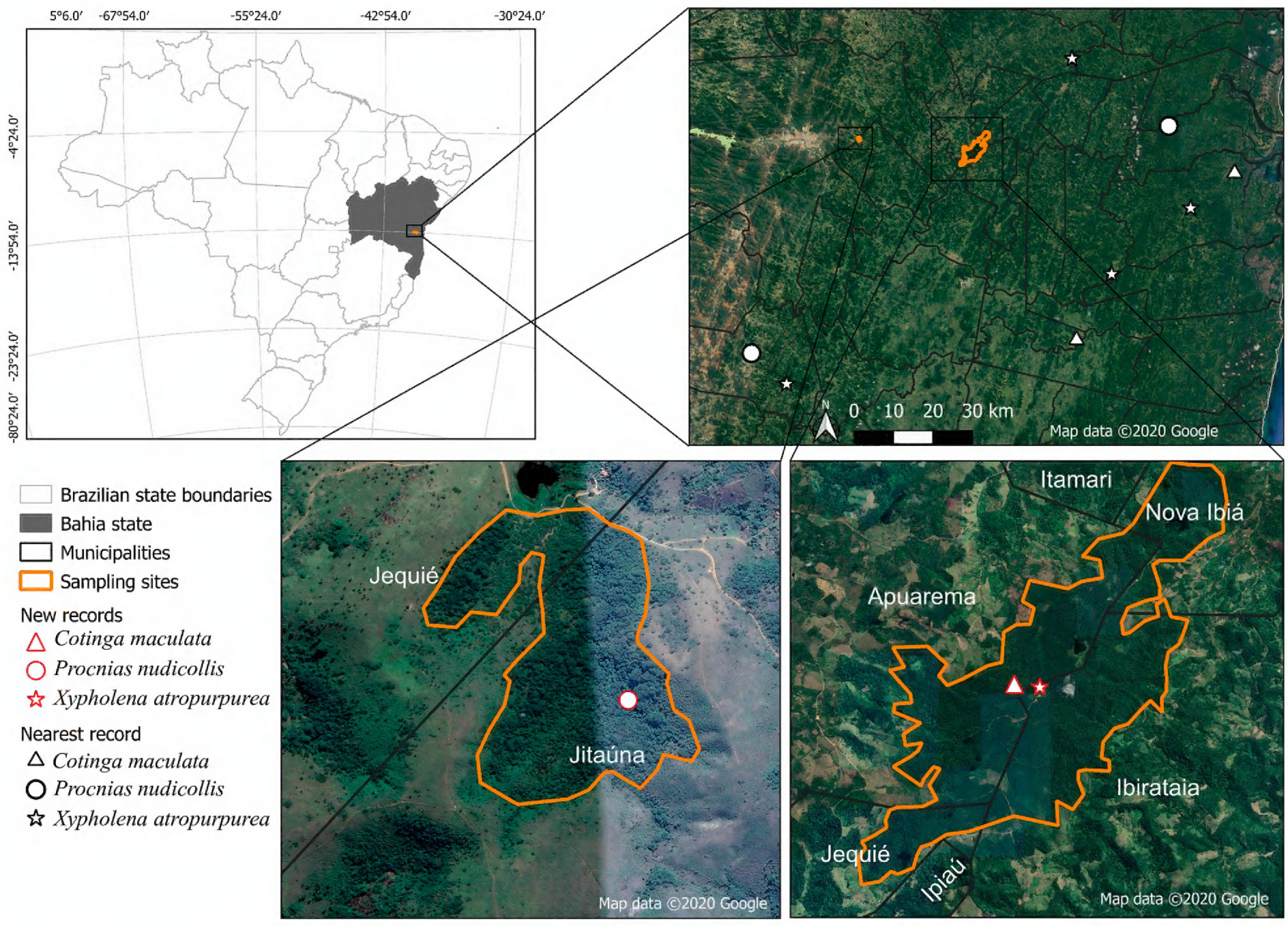

Figure 1. New records of threatened cotingas in Brazilian Atlantic Forest, with the nearest previous records included.

Jitaúna and Jequié, Bahia, and is accessible via the BR 330 highway. It is a small fragment of ombrophilous forest with an estimated area of 300 ha at an altitude of 760 m. Both studied areas are unprotected and surrounded by several small farms where wood extraction, agriculture, and hunting activities frequently occur.

From September 2016 to March 2018, we performed monthly non-systematic surveys in trails inside the forest fragments (trail length 1–2 km) from 06:00 to 10:00 AM. In the first fragment, we surveyed four trails, and in the second, only one. All bird species found were identified through vocalization and/or photographs. Many of these records are available at the WikiAves digital platform (http://www.wikiaves.com.br).

Data resources. The data underpinning the analysis reported in this paper are deposited at GBIF, the Global Biodiversity Information Facility, and are available at https://doi.org/10.15468/wp5bja (Bonfim et al. 2020).

Results

***Cotinga maculata* (Statius Müller, 1776)**
Banded Cotinga
Figure 2A

New record. BRAZIL • 1 ♂, adult; Bahia, Apuarema; 13°53′11″S, 039°41′56″W; 710 m a.s.l.; 8 Sep. 2017; observed by ERL, SVS, PLSC, and FCGB; photographic record available at WikiAves (Carneiro 2017; Vitorino 2017).

Identification. We sighted an adult male of *C. maculata*, which is the only species of its genus that is restricted to the Atlantic Forest (Snow 1982), perched high in a tree. The male presents a blue and purple coloration (Sigrist 2013), which is very different from other species (Fig. 1A).

***Xipholena atropurpurea* (Wied, 1820)**
White-winged Cotinga
Figure 2B

New record. BRAZIL • 1 ♂, adult; Bahia, Apuarema; 13°53′14″S, 039°41′36″W; 743 m a.s.l.; 12 Oct. 2017; observed by FCGB; photographic record available at WikiAves (Bonfim 2017).

Identification. *Xipholena atropurpurea* was identified by observing the plumage coloration of a male individual. Males are distinctive for this species in having blackish-purple body and white wings with black tips (Sigrist 2013) (Fig. 2B).

***Procnias nudicollis* (Vieillot, 1817)**
Bare-throated Bellbird
Figure 2C

New record. BRAZIL • 1 ♂, adult; Bahia, Jequié; 13°53′51″S, 039°57′11″W; 860 m a.s.l.; 3 Dec. 2016; observed by SVS and PBAJ; photographic record available at WikiAves (Vitorino 2016).

Identification. After observing an individual of *P. nudicollis*, SVS and PBAJ photographed it and heard its vocalization. The specimen was identified by its unique vocalization and plumage coloration. The male of *P. nudicollis* presents a fully white body, except for the side of the head and beak, which are greenish (Sigrist 2013). The vocalization is loud and easily recognized.

Discussion

In this study, we document new records from two unprotected Atlantic Forest fragments in southeastern Bahia of three globally Endangered or Vulnerable species. One of these species, *Cotinga maculata*, has been regarded as locally extinct in the region where we recorded it (BirdLife International 2020b). These species are usually recorded in protected areas in the Atlantic Forest (CEMAVE 2018), but forest fragments where we surveyed are unprotected and susceptible to human impacts. The fragment in the municipality of Apuarema, where we recorded *C. maculata* and *X. atropurpurea*, is relatively large (ca 2,500 ha) compared to most forest fragments of the Atlantic Forest, which are usually less than 50 ha (Ribeiro et al. 2009). The forest fragment in

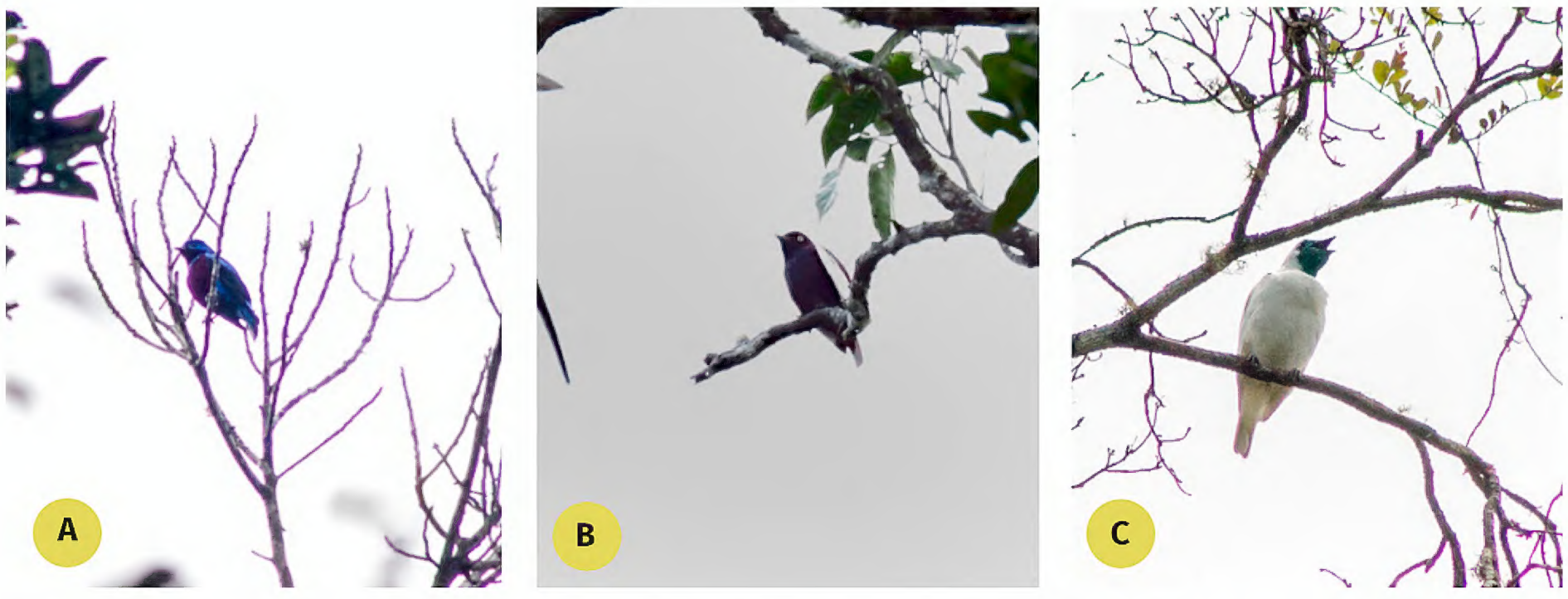

Figure 2. Three species of threatened cotingas in two Atlantic Forest fragments in Bahia, Brazil. **A.** *Cotinga maculata*. **B.** *Xypholena atropurpurea*. **C.** *Procnias nudicollis*.

the municipality of Jequié, where we recorded *P. nudicollis*, is small. Furthermore, we recorded *C. maculata* at higher altitudes (710 m) than previously described (200 m) (CEMAVE 2018), although Setubal (2015) reported it 650 m a.s.l. in the Área de Proteção Ambiental do Pratigi (APA do Pratigi hereafter), municipality of Ibirapitanga, Bahia. These elevation data suggest that these species can occupy higher altitudes in some forest patches to avoid highly anthropized areas where lower altitude forest areas are no longer available due to land conversion for agriculture and cattle raising (Tracewski et al. 2016).

Populations of cotingids are small and isolated due to fragmentation and habitat loss in the Atlantic Forest (Collar et al.1992). However, we know of few studies that have investigated population status and dynamics of these species. More knowledge is needed on the distributions of these species in order to development effective conservation strategies. Our record for *C. maculata* is 27 km away from APA do Pratigi where the species has been previously recorded (Setubal 2015). We have recorded *C. maculata* in an area where it was considered extinct by the International Union for the Conservation of Nature (IUCN) (BirdLife International 2020b). Thus, our record shows the presence of *C. maculata* in this unprotected area, thereby slightly increasing the distribution of this species to northwestern Bahia. Our new record of this species along with the nearby record by Setubal (2015), shows that this region encompassing Apuarema and APA do Pratigi possibly has sufficient suitable habitat and resources to support a viable population. On the other hand, a recent 2015 record of this species from Pernambuco (Patrial 2015), which is more than 700 km from Bahia, and outside the distribution range proposed by IUCN (BirdLife International 2020b), needs further consideration about the presence of a population in those area.

For *X. atropurpurea* and *P. nudicollis*, little information on the presence of these species is available in the literature (CEMAVE 2018). *Procnias nudicollis* seems to be less impacted by deforestation and fragmentation and is present in most parts of the Atlantic Forest, including in eastern Minas Gerais (Ferreira 2011) and southern Bahia (Hasui et al. 2018). This species was also recorded in the Apa do Pratigi (Setubal 2015), which is located 55 km from our record. However, the combination of habitat loss and illegal trade has caused a decline in its population (BirdLife International 2020a). Recent records of *X. atropurpurea* have been reported from Alagoas in northeastern Brazil in 2018 (Portes et al. 2018) and Ibirapitanga, Bahia (Setubal 2015), 27 km from our study site. The IUCN considers that *X. atropurpurea* "possibly extant" in our study area, which is confirmed by our record and that of Setubal (2015). Our record is 500 km apart from the Biological Reserve of Una, where the species is considered to be resident (BirdLife International 2020c).

The cotingid species recorded in this study are known to provide important ecosystem services, such as the dispersal of medium-sized seeds, which can contribute to forest regeneration (Pizo et al. 2002; Godoy 2018). Therefore, there is a need to intensify populational and ecological studies of these species both in Bahia and other parts of their geographical range, which may contribute important data, such as abundance, density, population size, and fill knowledge gaps in their occurrence.

The presence of these cotingids indicates the great value of these forest fragments for biodiversity conservation at the national and global level, and these forest fragments probably have high-quality habitat which provides the necessary resources for these sensitive cotingid species. Additional research is needed in both fragments, as they may harbor other rare or threatened species, but our findings increase the distributional knowledge of these threatened species, which can aid their conservation and the creation of new protected areas.

In the first forest fragment in the municipality of Apuarema, we also have recorded two forest species, *Tout surdus* (Kuhl, 1820) and *Myrmotherula urosticta* (Sclater, 1857) (unpubl. data of the authors), both Vulnerable species (BirdLife International 2019).

Authors' Contributions

All authors conducted fieldwork. FCGB wrote the first draft of the manuscript. All authors contributed reviewing the text.

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